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SCIENCE NEWS LETTER

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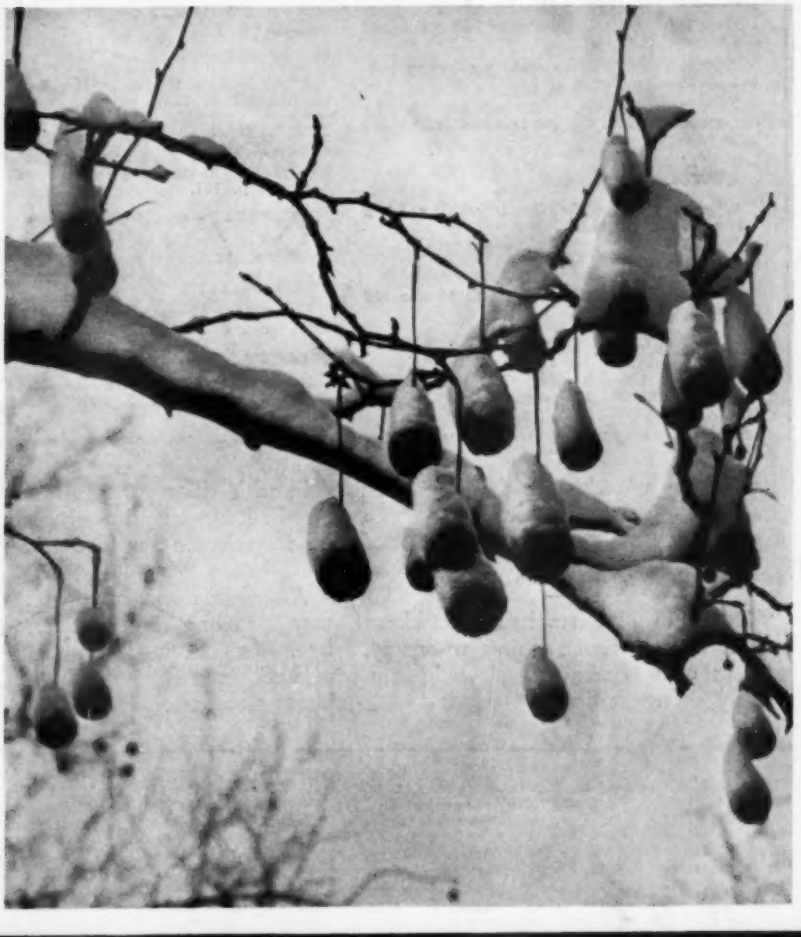

February 17, 1940

Cold Beauty

See Page 110.

A SCIENCE SERVICE PUBLICATION

Do You Know?

During the late Middle Ages, three of the rectors of the University of Paris were Finns.

A technical school is starting the first course in the design of welded structures to be offered in New York City.

New York agriculturists are trying to devise simple and reliable tests to detect forest tree and shrub seed that will not germinate.

Nutrition standards of the Finns are the finest in the civilized world today, declares Michael J. Walsh, University of California nutritionist.

"Lack of rubber," says Secretary of Agriculture Henry Wallace, "is the greatest single obstacle to our having a self-sustaining Western Hemisphere.

An agricultural experiment station has produced a clear and attractive rhubarb juice by pressing the rhubarb between folds of muslin, and using lime to take out the oxalic acid.

It takes the whole alphabet to list occupations required in making modern automobiles, with at least 47 occupations under the letter C alone, and so on to X-ray man, yardman, and zinc plater.

Although the island of Crete is seen by some archaeologists as an ancient center of empire, ruling wide areas of the Mediterranean mainland, yet no Cretan artist apparently thought it worth while to portray historic events.

QUESTIONS DISCUSSED IN THIS ISSUE

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PHYSIOLOGY—PSYCHIATRY

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PUBLIC HEALTH

For what diseases have new low death rates been established? p. 104.

ZOOLOGY

For what will the Smithsonian-Firestone expedition search in Liberia? p. 105.

A special nickel steel developed for armor plate is used in thicknesses up to 26 inches in protecting vital parts of battleships.

New Guinea natives had ideas about waging economic war against an enemy, such as using charms that would supposedly destroy crops.

Starfish destroy and eat enough oysters in Long Island Sound alone to cost irate oystermen $750,000 a year.

A zoologist says that there is no known way of telling the age of an adult bird by looking at it—loss of feathers, state of beak or claws may indicate disease, but not old age.

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MEDICINE

Treatment for After-Effects Of "Sleeping Sickness" Helps

White Wine Extract of Bulgarian Belladonna Relieves Rigid Muscles and Mask-Like Faces; Not a Cure

HOPE for recovery of patients disabled by the tragic after-effects of an attack of "sleeping sickness" or encephalitis appears in the report of good results an American physician, Dr. Howard D. Fabing of Cincinnati, has had with a medical treatment imported from Bulgaria via Italy.

While the new medical treatment cannot be called a cure, 22 out of 23 totally incapacitated patients were helped by it, nine of them showing marked improvement, Dr. Fabing reported. (*Ohio State Medical Journal,* November.) The rigid muscles, mask-like faces and peculiar gait are the after-effects chiefly helped by the treatment. The patients feel better, but the mental symptoms are not always relieved.

The medicine used is a white wine extract of the Bulgarian belladonna plant. This medical treatment was first promulgated by a Bulgarian herbalist, Ivan Raeff, of Chipka. Clinics for giving this treatment were established throughout Italy by Queen Elena. More recently, English and American physicians have tried the treatment with good results.

Why Bulgarian belladonna should be better than that grown elsewhere, and why a white wine extract is better than one made with ethyl alcohol or distilled water are questions pharmacologists have not yet been able to answer. Doctors using the treatment, however, find that the white wine extract of Bulgarian belladona is the best combination. One of them, Dr. Josephine B. Neal, of New York City, declares that after an intensive 10-year study of many cases of chronic "sleeping sickness" and many kinds of treatment, she finds the Bulgarian treatment "by far the most effective method of therapy."

Patients given the Bulgarian treatment begin to improve anywhere from the third to seventh day after starting to take the medicine, Dr. Fabing found. Greatest gains were made within the first two or three weeks. No dietary restrictions are necessary, but all the patients reported they could not tolerate alcoholic drinks while taking the medicine.

The medicine has a slightly sedative effect, Dr. Fabing reported. Patients sleep a little longer at night and like a nap in the afternoon.

The mental symptoms which are an after-effect of "sleeping sickness" are variously affected by the treatment. One young man who had a severe anxiety state was completely relieved, Dr. Fabing reported, but "a girl with impulsive behavior continues to be a problem to her family."

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STUDYING TRANSPARENT SHEETING

Dr. Herbert F. Launer, demonstrates at the National Bureau of Standards, his new photochemical method for study of such solid materials as cellulose, plastics, rubber sheeting, etc. Light after passing through filters to remove undesired wave lengths strikes the sheet which is held in intimate contact with a thermostated aluminum backing. The backing removes the heat. Moisture and oxygen content of the air around the sample are controlled and varied.

CHEMISTRY

Rubber Pierced With Holes Makes New Chemical Filter

THE number of things that rubber is being used for these days is amazing —not just tires, overshoes or erasers, but transparent sheeting, adhesive and now filters.

Filtering is one of the most important processes in chemical industry, removing solids from liquids. And many things are used for filters, paper, cloth, diatomaceous earth, metal wire screens, etc.

Now add to the list rubber filters with all the chemical resistance and durability of that material. Looking like ordinary sheets of rubber, the new filters are pierced with many small holes, A light behind them shows that they really are rubber sieves that let water through instead of holding it back. The finest rubber filter has 6400 round holes per square inch, each pore from four to five thousandths of an inch in diameter.

How they are made has chemists guessing. Some think the rubber is molded around a bank of fine wires under tension making the holes in the rubber finer than the wires. Others hold that a mold full of holes is used and the rubber pressed into it. Manufacturer: Filter Media Corporation.

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CHEMISTRY

Nylon Used to Make Paper And Fabrics Water-Proof

Chemical Material Made From Coal, Air and Water Now Used To Coat Leather to Produce "Patent Leather"

A NEW patent just issued by the U. S. Patent Office reveals that the new nylon material—chemical wonder made basically from coal and air and water—can be used to coat paper, leather, cloth and wire mesh to produce oilproof paper containers, a superior patent leather, long-wearing, flexible, water-proof clothing and a sturdy, transparent kind of window glass.

The new patent is No. 2,188,332 just issued posthumously to the late Dr. Wallace H. Carothers, chemist of the E. I. du Pont de Nemours & Co.; the man who obtained the basic patents on nylon. The patent is assigned to du Pont.

The new Carothers patent describes how to use the chemical material nylon in its new coating form. Paper impregnated with the chemicals, says the patent, was very greaseproof and "showed no visible penetration of a colored turpentine solution after 240 minutes of contact."

By pressing the chemicals, known as polyamides, into goat's leather a glossy finish was obtained that resembled patent leather but which resists wear and cracking, due to flexing, many, many times over ordinary patent leather.

Applied to cotton broadcloth the chemicals produced a flexible cloth that strongly resisted tearing and was waterproof.

When spread over wire mesh the materials formed a transparent, clear, strong "glass" transmitting ultraviolet light.

The nylon coating, with its greaseproof and water-proof properties, can be applied to "wire mesh, metal sheets, silk, artificial leather, regenerated cellulose, teal, duck and various papers," claims the Carothers patent. These bases for the coating can be in the form of sheets, filaments, foils, yarns or fabrics.

Nylon is the name coined for the chemical material which has now been developed from the Carothers patents of 1938. Nylon stockings, giving Japan headaches because they compete with silk stockings in looks but possess very superior wearing qualities, are the most recent form in which nylon is now known to the public. But tooth brush bristles, fish line leaders, surgical thread for operations, and strings for tennis racquets are only a few other uses of this polyamide that is made from coal tar derivatives and comes basically from coal, air and water. (*See page 106*)

The polyamides used in this newest patent of Dr. Carothers is a combination of materials with jaw-breaking names. For some of his coatings, Dr. Carother's patent describes the material as being composed of a mixture of hexamethylene diammonium adipate and decamethylene diammonium sebacate.

Particularly stressed in the new patent for coating materials, is that films are very flexible, have exceptionally good adhesion to the base materials, are durable and possess very superior elastic qualities. It is this elasticity, in fact, which probably accounts for many of their superior qualities for it permits the coating film to expand and contract with the base materials at will. Most cracking of coating comes from lack of this ability.

When applied to paper in sheet form, or in containers, the nylon coatings offer possibilities of tapping a great field now served by the tin can and glass bottles industries, the packaging of greases and oils.

When applied to fabrics the new coating produces superior shower curtains, window shades, washable table cloths and rain coats.

On leather the coatings give the "patent leather" shine but without the objectionable cracking handicaps.

On wire mesh sheets of transparent material for windows are created.

Science News Letter, February 17, 1940

CHEMISTRY

Gas From Oil Refineries Important in Industry

GAS plays an important part in American industry, not just the kind of gas piped into our homes for cooking and heating, but gas by the millions of tons produced as a by-product of the gigantic petroleum industry.

Between 7 and 8 per cent by weight of the total crude oil processed in American refineries becomes gas—940,000,000 cubic feet a day, or 14,000,000 tons per year.

One company alone is making commercially more than a hundred synthetic chemicals from ethylene, propylene, and the butylenes in the refinery gases. Even drinkable and industrially useful ethyl alcohol is synthesized from cracked gas, a synthetic chemical invasion of the time-honored making of alcohol by fermentation. Other major chemicals similarly made are ethylene glycol, familiar as auto anti-freeze, and isopropyl alcohol, used to make the solvent acetone.

Bottled gas for cooling and heating in rural areas is compressed propane from refinery gases, a gas also important in manufacturing lubricating oils.

Latest use of refinery gases is for conversion into high octane fuels for automobiles and airplanes, promising more load-carrying with less fuel utilization.

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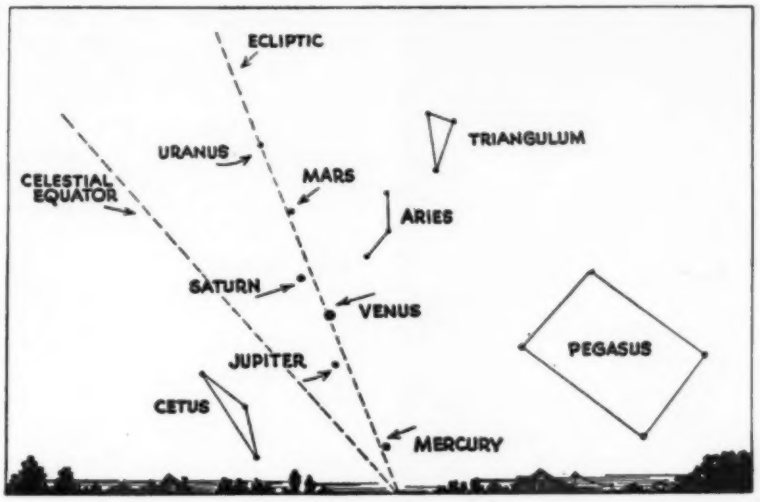
Scientists are ingeniously tagging all sizes of creatures, from moths to whales, to track their wanderings, and for starfish they find harmless blue dye most useful.

RARE EVENT

This view taken in the Hayden Planetarium of the American Museum of Natural History, shows the unusual line-up of five naked-eye planets that can be seen at the end of February for the first time in many lifetimes. Still another planet will be in the same location in the sky and may be seen with the aid of a small telescope. See map on facing page.



WHERE TO LOOK

This map will aid you in identifying the various members in this month's stellar ballet. Mercury is hard to see because it is so close to the sun. Look low in the west just after sunset. From about Feb. 23 on for a few evenings you will be able to see it with bright Venus, Jupiter, Mars and Saturn. Uppermost will be Uranus, but you will need the aid of a telescope to see it. On Feb. 20 you can see a conjunction of the glorious Venus and Jupiter; they will be just a degree apart at sunset.

PHYSIOLOGY—PSYCHIATRY

Lack of the B Vitamins May Cause Nervous Breakdown

Fearfulness and Jittery Activity Found To Be Early Signs of Developing Pellagra; Permits Prevention

NERVOUS breakdowns which transform strong, courageous men into weak, frightened creatures and drive over-tired women into constant, jittery activity are sometimes due to lack of the B vitamins, Drs. J. P. Frostig, of the University of California, and T. D. Spies, of the University of Cincinnati and Hillman Hospital, Birmingham, Ala., have discovered.

Discovery of the nerve-shattering effect of a diet lacking in these vitamins indicates that faulty diet widespread in a population may affect not only its health and strength but may break down its morale. It also provides a chemical approach to at least one group of nervous breakdowns.

The nervous symptoms which appear when the B vitamins are lacking in the diet give doctors the first signs by which they may diagnose pellagra, Drs. Frostig and Spies state. (*American Journal of Medical Sciences,* February.)

The nervous signs appear in patients who have no other symptoms of pellagra and who might therefore be labeled neurotic or neurasthenic.

Doctors have long known that pellagra affects the nerves. Many pellagra patients in the past ended their days in insane asylums. The nervous symptoms which foretell an impending attack of pellagra, however, and which link vitamin lack with breakdown of morale, have apparently never before been noted as a sign of vitamin deficiency.

Regardless of what type of personality the patients normally have, when they begin to get pellagra, they all develop the same characteristics. They are restless, excitable, and easily frightened. Noises make them jump, odors bother them more than usual. They are tired but cannot sleep and are too "fidgety" to rest. They feel depressed and constantly expect some harm to befall them or their families. A brawny coal miner who liked to engage in prize fights said:

"I'm scared to death. If I see two men fighting with their fists, it seems to me that I will pass out."

Either of three parts of the vitamin originally known as B cures the condition. Chemically, these three B vitamins are known as thiamin, cocarboxylase, and nicotinic acid. They are all found in fresh meat, fresh vegetables, eggs, milk and yeast. When the nervous patients were given a dose of one of the three vitamins, they felt better within an hour, and within 24 hours neurological tests showed their nerves were reacting normally to touch, pain and the like.

While nervous symptoms had been seen in patients with pellagra, the exact relation between the B vitamins and nervous breakdown was established in a careful study of 60 pellagra patients here, with the support of the Rockefeller Foundation and the William C. Hogg Memorial Fund of the University of Texas.

Lesson for Belligerents

A LESSON for the warring nations of Europe appears in these latest studies of pellagra patients in peaceful America. Leaders of the warring nations know the importance of keeping their armies and civil populations well nourished. But to Napoleon's famous dictum, "An army marches on its stomach," scientists now add that the kind of food, as well as the amount, is of paramount importance for morale as well as for health.

Strong men become weak—"shaky, weary and apprehensive"—even on full stomachs if they lack the B vitamins that protect against beri-beri, pellagra and similar nervous disorders. Long before beri-beri or pellagra develops to the point where other symptoms make the diagnosis clear, tell-tale nervous signs appear. In their report to fellow physicians, Drs. Frostig and Spies state:

"Nutritional deficiencies widespread in a population may not only weaken the strength, but may also break down the morale. Sub-clinical pellagra and beriberi may be an important factor in the fighting morale of an army, supporting Napoleon's contention that 'an army marches on its stomach.'"

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A clay tablet found at Nippur shows some of the drugs and prescriptions used in Babylonia about 2600 B. C.

Popcorn that expands 20 times its size when popped will be considerably more tender than corn that expands only 10 times.

SCIENTISTS SAY:

Not This— *But This*

PSYCHOLOGY—SOCIOLOGY

Would the World Be Better If the Women Proposed?

Leap Year Raises Question But Scientists Say No; Successful Women Steer Proposals Anyway

LEAP YEAR'S here! And the ladies have their Big Chance to propose marriage, so we all understand.

Suppose American women in general —including feminine readers of these words—took that chance seriously. Suppose it was the custom for women to speak up and propose, not merely in Leap Year, but any year! Would our civilization improve?

Science Service has put this question to a panel of men and a woman, who have scientific background for a wise answer. It is a poser that would have tangled wise old King Solomon. He hadn't the slant on our social set-up. It is a question for the strictly modern psychologist, anthropologist, sociologist, and eugenicist. And here's what they say:

Women don't need Leap Year advantages to steer a proposal, is the summed-up verdict. It generally takes two to make a modern proposal. And as for civilization—but let the scientists speak for themselves.

"A social convention that women should make the first verbal suggestion of marriage would not change actual procedures very much."

Here speaks a well-known psychologist, Prof. Knight Dunlap of the University of California. He thinks the words, will-you-marry-me, or variants of that formula, play a minor part in modern marriage preliminaries.

"Marriage," he declares, "is based on mutual agreement, and the formal proposal is merely a step based on procedures which are at present as often initiated, in reality, by the woman as by the man."

Women do a good deal of the verbal proposing, anyway, he is pretty sure. And many couples find themselves saying, "I do," without either party having spoken a formal invitation to marry.

So—Dr. Dunlap doubts that our civilization would change to any important degree should etiquette and convention reverse popular form, and approve of women regularly popping the question.

But if women should take to proposing formally, it might change conventions of behavior in minor ways, Dr. Dunlap foresees.

For example? Well, that's hard to predict. But—taking a male-view shot at results of women getting the vote, he comments whimsically:

"An analogous case is presented by woman suffrage, the main social or political effect of which has been that men may now smoke in dining cars."

Agreeing with Dr. Dunlap's view that women's proposing would not help civilization along conspicuously, is the view of Dr. Hortense Powdermaker, anthropologist and sociologist of Queens College, Flushing, N. Y.

Any improvement in civilization is too complicated to be the result of reversing traditional speaking roles in courtship, says the only woman on Science Service's panel on marriage proposal.

And, as a student of human customs, she adds:

"Anyway, since the beginning of time women have been taking the initiative subtly."

More detailed explanation of why the roles of man versus woman in courtship are pretty good as they stand is furnished by a specialist in eugenics and human well-being, Dr. Paul Popenoe, general director of the Institute of Family Relations, in Los Angeles.

Declaring that for millions of years in evolution, the male has taken the initiative, seeking the female, he continues:

"It is the latter's role not to be aggressive, but to be seductive and alluring. It is not likely that this long-standing role can be reversed now without causing some discomfort to both men and women. In fact, few women want to reverse it.

"Those who demand that women be allowed to propose are mainly the unsuccessful women. They overlook the fact that no law now prevents a woman from proposing. She may propose any time she feels like it. Abundant evidence, however, shows that it is usually not worth while for her to do so. She is not proud of the exploit later; and I suppose no man ever felt flattered to have a woman propose to him.

If She Is Clever

"A successful woman can maneuver a man into a position where he will propose to her, thus keeping in his hands, at least ostensibly, the traditional masculine initiative which is so dear to him. If she is not clever enough to get a man to propose to her, she may not be clever enough to keep a husband after she gets one.

"Surveys by the Institute of Family Relations show clearly that the average educated woman does not admire a man who is lacking in initiative, aggressiveness, and responsibility; she does not

● Who Started Woman's Leap Year Wooing?

Nobody knows, for certain, who invented the idea of women proposing during Leap Years.

In the middle Ages there were laws giving maiden ladies this liberty. Here is a Scottish law of 1288, which also gave bachelors a chance of escape by paying up to one pound (roughly $5 in our money):

"It is statut and ordaint that during the rein of hir maist blissit Megeste, for ilk yeare knowne as lepe yeare, ilk mayden layde of bothe highe and lowe estait shall hae liberte to bespeke ye man she likes, albeit he refuses to taik hir to be his lawful wyfe, he shall be mulcted in ye sum ane pundis or less, as his estait may be; except and awis gif he can make it appeare that he is betroithit ane ither woman he then shall be free."

want to have to propose to a husband; and she should certainly not do so."

What would improve matters, Dr. Popenoe believes, is this:

"Better education of both men and women for marriage, with the elimination of some of the feminist influence, will solve such problems as now exist. They cannot be solved by trying to override the age-old distinction between masculine and feminine behavior."

And that brings us to the plain-spoken recommendation of an anthropologist, Prof. Earnest A. Hooton of Harvard University, noted for his straight-from-the-shoulder criticisms of the human species.

"What this civilization needs is fewer and better babies," began Prof. Hooton's terse reply to the query about women proposing marriage.

Prof. Hooton in recent years has been warning all who will listen that mankind may be good at gadgets, but human beings compare unfavorably with apes in many ways as efficient members of the animal kingdom.

Human beings go right along, indifferent to the production of morons, criminals, and social ineffectuals. They are told that biological science offers hope for improving mankind. But they take little concern for the future.

All of which explains why, while Prof. Hooton prescribes "fewer and better babies" for a better civilization, he adds gloomily:

"Since both sexes are equally ignorant of human genetics, it makes no difference which chooses. 'Can the blind lead the blind? Shall they not both fall into the ditch?'"

Prof. Hooton is fairly cheerful about the rising generation, though. He has given it credit for having enough clever youngsters to push ahead with the hard task of evolving a code of biological ethics. Such a code put into practice, he believes, would enable mankind to become more honest, unselfish, decent, and considerate in all his human relations.

That anthropological advice seems a long leap from Leap Year—with which this account started—but it does end with an idea of science for improving civilization.

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CLIMATOLOGY

Apparent Climatic Shifts Are Really Fluctuations

Experts Declare That Crediting the Warm West Coast Weather on Movement of Japan Current Is Just Guess

APPARENT climatic shifts, such as the current one that has brought a warm winter to the whole Pacific Coast while the entire country east of the Rockies has had to shovel snow, are to be regarded as fluctuations in a longer or shorter cycle rather than permanent changes. Such is the concensus of opinions independently expressed by scientists of the U. S. Weather Bureau, the U. S. Coast and Geodetic Survey and the Hydrographic Office of the U. S. Navy. And whatever causes them, a supposed shift in the Japan Current must not be held responsible.

There is a slow, wide swing in air temperatures, not only for the Pacific Coast but for the whole world, that takes about a century to go through, stated J. B. Kincer of the U. S. Weather Bureau. There was a succession of warm years about a hundred years ago, and we seem to be having another one now. In between, shortly after the middle of the nineteenth century, there was a group of low-temperature years, with cool summers and severe winters. Rainfall cycles (if they can properly be called that) are of considerably shorter duration than this long temperature swing, Mr. Kincer said.

Crediting recent warm Pacific Coast winters to a southward shift in direction of the Japan Current was scouted as unfounded guesswork by both H. A. Marmer of the U. S. Coast and Geodetic Survey and Comdr. H. Hartley of the Hydrographic Office. It is a case of reasoning backward: A shift in the Japan Current could cause a change in climate; the climate on the Coast seems to be changing; therefore the Japan Current has shifted.

The only trouble with that proposition is that nobody knows whether the famous current has shifted or not. It would be possible to go and find out, but that would take ships, men and money, none of which are available now—or likely to be, with Congress cutting deep even into existing research appropriations.

Until valid evidence to the contrary is brought forth by a well-supported well-planned, long-continued research program, there is no justification for supposing that the Japan Current has shifted or is shifting. If revolutionary changes had taken place in the ocean bottom recently, with tremendous, world-shaking earthquakes, we might be justified in assuming a shift in the current; but such cataclysmic events have not taken place. So we must let the "Kuro Siwo" flow in peace.

From the Pacific Coast, Prof. George E. McEwen of the Scripps Institution of Oceanography, at La Jolla, Calif., offers support to his scientific colleagues in Washington. "Although it may seem as though the climate is changing," says Prof. McEwen, "there is no evidence that the trend will continue in the same direction."

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ANTHROPOLOGY

Set Important New Date For American History

AN IMPORTANT new date for history books has been worked out by two Harvard University geologists: Nearly 25,000 years ago the first Americans arrived. Dr. Kirk Bryan and Louis L. Ray reached this verdict by intensive study of the camp ground of Folsom Man in Colorado, and it looks as though a long scientific argument over antiquity of man in America is about over. Incidental weather note: Folsom hunters found Colorado chillier than it is today.

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GENERAL SCIENCE

Finns To Translate, Index Important Science Papers

SCIENTIFIC news from beleaguered Finland: The Finnish government has decided that all scientific papers and reports of research published in Finland will be assembled, indexed and examined by an official committee of experts, which will see to it that the principal papers are translated into English, French and German, thus making less difficult the distribution of detailed information concerning research done in Finnish institutions.

Russian bombs are taking their toll among scientists: Dr. J. U. Ant-Vuorinen, lecturer in analytic chemistry at the Technical College of Helsinki, was killed in one of the early air raids.

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PUBLIC HEALTH

New Low Death Rates For Eleven Diseases

NEW LOW death rates for 1939 were registered for 11 diseases. For only three were there new high mortalities.

Taking the bad news first: The cancer death rate rose for the third successive year, reaching 101 per 100,000, the first time it has exceeded 100—an increase in the crude cancer death rate of 30% in a decade.

Coronary artery diseases rose sharply to 40.2 per 100,000, almost nine times that recorded at the beginning of the decade just closed.

The diabetes death rate jumped from 24.8 in 1938 to 27.5 per 100,000 in 1939.

Now for the good news: Never before has there been even a close approach to the figures for 1939 for the principal communicable diseases of childhood—measles, scarlet fever, whooping cough and diphtheria. The death rate for this group was only 4.2 per 100,000, a drop of 34% in a single year and 79% in 10 years.

Tuberculosis caused less than 45 deaths per 100,000, little more than half what it was 10 years ago. Pneumonia mortality dropped 15% in a single year, to 42.9 per 100,000, 52% in 10 years. The mortality rate for infantile diarrhea declined to 3.7 per 100,000, a new minimum and less than one-fourth of the figure registered a decade ago. Diseases of pregnancy and childbirth hit a new low of 5.4 per 100,000, down 60% in 10 years.

There were fewer fatal accidents than ever before, 46.3 per 100,000, 4.3% below 1938 and 29% below 10 years ago. Death rate from alcoholism plunged 20% in a single year, the figure of 1.2 per 100,000 being about a third of that registered a decade previously. The suicide rate was 8.6 per 100,000 in 1939, the lowest since 1929. Homicide rate was 4.4 identical with minimum achieved in 1938. These figures are from Metropolitan Life Insurance Company statisticians based on their policyholders.

Science News Letter, February 17, 1940

ARCHAEOLOGY

Unearth Remains of Palace And Gardens of Cleopatra

ARCHITECTURAL wreckage—what is left of Julius Caesar's gardens and the palace where he established fastidious Queen Cleopatra during her three-year stay in Rome—has been coming to light during excavations in Rome.

Little has been known in modern times of the famed gardens of Caesar, from which doubtless Cleopatra gathered some of the roses which she used in profusion, for their sweetness. Her banqueting floors, it was said, were sometimes strewn knee-deep in petals.

The gardens, which Caesar willed to the Romans for a park at his death, are now believed to be definitely located by the finding of walls, frescoes, and works of art.

Science News Letter, February 17, 1940

METEOROLOGY

Byrd's Snow-Cruiser Crew Complains of Snow Lack

ADMIRAL BYRD'S snow-cruiser crew are dissatisfied with the weather in Antarctica. There isn't enough snow. The ten-foot, three-ton rubber-tired wheels of the enormous vehicle can't find proper traction, and the snow cruiser will have to be kept close to base camp until autumn sets in, about the end of this month.

Since Antarctica is at the "far end" of the Southern Hemisphere, it is only a little past midsummer there now, and the snow cover is at its minimum. Winter, when snow cruising may also be a little difficult, sets in about mid-April and lasts until late July. Members of the expedition will while away the tedium of the long winter evening (several weeks it lasts) by taking seismic soundings and observations on the weather, cosmic rays, and geological formations.

Science News Letter, February 17, 1940

IN SCIENCE

ENGINEERING

Standardization Will Aid The Painter in Oils

SCIENCE, art and industry are about to do something about the oil paints the artist uses. The painter in the future will be able to use colors scientifically certified so that his creation on canvas will not be lost to posterity due to impermanent materials.

Collaboration upon a standard for artist's oil paints is under the auspices of the National Bureau of Standards and based upon three years of study by the Massachusetts Art Project. The standard is expected to guide artists in purchase of paints of satisfactory color, working quality, and durability, to eliminate confusion in nomenclature, and to promote fair competition among manufacturers by providing ways of telling satisfactory paints from those of unknown or inferior quality.

Science News Letter, February 17, 1940

PHYSIOLOGY

Course of Vitamin in Body Traced With Radioactivity

DETERMINED to discover what happens to vitamin B_1 or thiamin in the human system, California Institute of Technology scientists are tracing the course of the vital vitamin through the body. It is rendered "visible" by radioactivity.

Synthetic thiamin is made with sulfur made radioactive by the huge University of California cyclotron at Berkeley.

Its artificial radioactivity is clocked by one of the most elaborate arrangements of Geiger counters ever devised.

These counters, similar to those employed in cosmic ray research, check the radiation from the vitamin as it becomes a part of the human body.

John B. Hatcher, bio-chemist, who has conducted the experiment, is his own "guinea pig." He takes doses of radioactive vitamin himself, then uses the Geiger counter apparatus to determine the amount destroyed, utilized and wasted.

Science News Letter, February 17, 1940

E FIELDS

BOTANY

Noted Botanical Editor Moves to United States

NEWEST arrival among scientific world figures to transfer his activities to the United States is Dr. Frans Verdoorn, editor and general manager of *Chronica Botanica* and other plant science publications, and secretary of the International Union of Biological Sciences.

Formerly located at Leyden, The Netherlands, Dr. Verdoorn has just arrived in this country, and will shortly be established at the Arnold Arboretum of Harvard University, located at Jamaica Plain, near Boston. He has brought with him his scientific collections and his library, and expects to become permanently established in the United States.

Dr. Verdoorn was engaged in the preparation of an international address book of plant taxonomists when the war broke out, and despite the disturbing effects of the hostilities practically surrounding his country he was able to complete preparation of the manuscript. The book will be published in the near future.

Science News Letter, February 17, 1940

ZOOLOGY

New Expedition Leaving For Liberia For Animals

A NEW Smithsonian-Firestone expedition to the tropical jungles of Liberia, to get new animals and birds for the National Zoological Park, is leaving the United States, just as an assorted cargo of Antarctic fauna is getting under way from the South Polar regions.

Leader of the expedition is Dr. William M. Mann, director of the Zoo, who is accompanied by Mrs. Mann, his collaborator on previous expeditions into the tropics. They sailed from New York on Feb. 14.

Sponsor is Harvey S. Firestone, Jr., whose father, the late Harvey S. Firestone, first manifested an interest in the National Zoological Park many years ago, when he presented Dr. Mann with a rare pygmy hippopotamus, still prize exhibit in the pachyderm house.

Liberia offers particularly good hunting in "small model" mammals. Besides the pygmy hippopotamuses of which Dr. Mann hopes to obtain more specimens, there are pygmy elephants and the little chevrotain or water deer —the latter a tiny hoofed creature that stands only a foot high at the shoulder.

Besides these, the expedition will seek zebra antelopes, red bush cows, West African forest leopards, and two species of serval, which are large, long-legged, big-eared cats. Birds hoped for include black and white crows, hornbills, sunbirds, and interesting tropical species of storks and cranes.

Science News Letter, February 17, 1940

CHEMISTRY

Germans Have No Hope For Deadlier War Gas

GERMAN chemists are of the opinion that there is little prospect of finding new war gases more deadly than those already known, reassuring information relayed by the American Chemical Society's *Industrial and Engineering Chemistry,* which checks with ideas prevalent in U.S.A. chemical circles.

Science News Letter, February 17, 1940

BOTANY

New Name Proposed For California's Big Tree

CALIFORNIA'S famous Big Tree species, long known botanically as *Sequoia gigantea,* is proposed for renaming by Prof. J. T. Buchholz of the University of Illinois, who has made a close study of this largest of trees and of its relative the coast redwood, *Sequoia sempervirens.*

The two trees are so different, Prof. Buchholz points out, that they should not be included in the same genus of plants. Accordingly he proposes a new name for the Big Tree: *Sequoiadendron giganteum.* The "dendron" addition to the old name is the Greek word for "tree."

The name Sequoia was first proposed for the coast redwood, in honor of the remarkable half-breed Cherokee leader, Sequoyah, who did much for the benefit of his fellow Indians in the early nineteenth century. An effort was made in 1853 to rename the Big Tree Wellingtonia, in honor of the great English general, but for technical reasons that name failed to stick.

Science News Letter, February 17, 1940

CHEMISTRY

Metallic Sodium Loaded As Liquid, Shipped Solid

NOT many years ago the metal sodium, which in combination with chlorine is most familiar to us as common salt, was almost a laboratory curiosity in its metallic state because when exposed to the air it bursts into flame. Those who attended chemistry classes not many years ago and saw this metal handled like so much high explosive will be startled by information that now metallic sodium—by the ton—is transported in tank cars and sold at about the same price as copper.

Du Pont has a fleet of cars, each holding 40 tons of sodium which is loaded and unloaded as a liquid but shipped as a solid. Sodium by the ton is converted daily into high purity sodium cyanide for use in electroplating and heat treatment of metals. Other uses of metallic sodium: To make sodium peroxide for use as a textile bleach and as raw material for medicinal compounds containing active hydrogen such as zinc peroxide and sodium perborate, in indigo dyes, in preparation of lead tetraethyl used to produce anti-knock gasoline and for use in preparing such new wonder drugs as sulfapyridine for pneumonia.

Science News Letter, February 17, 1940

MEDICINE

Now Castor Oil Bottles Will Wear a Warning Label

UPON the labels of the medicines that you can buy at the Nation's drugstores there will soon be not only the names of the drugs but useful warnings when those drugs are likely to be used harmfully, for self-medication, family remedies. Since the first of the year this new kind of labeling has been required by federal law administered by the Food and Drug Administration, but the federals making drugs safer are not likely to get tough about the labeling provisions until after the middle of the year.

Take the old familiar remedy, castor oil, which will be found wearing the following warning:

"Not to be used when abdominal pain (stomach-ache, cramps, colic) nausea, vomiting (stomach sickness) or other symptoms of appendicitis are present. Frequent or continued use of this preparation may result in dependence on laxatives. Do not use during pregnancy except on competent advice."

Science News Letter, February 17, 1940

CHEMISTRY

Fabrics of the Future

Chemistry Now Makes Fabrics for Clothing From Milk, Coal, Metals, and Even Air and Water

By ROBERT D. POTTER

AFTER the Garden of Eden, or its anthropological equivalent, man set out to hide his nakedness in clothing and has been doing it, more or less, ever since. In those countless years probably everything that naturally exists in the world has been used or tried for clothing.

The great advance of the past came when man learned to obtain fibers, group them into threads and yarn, and weave them into cloth that could be fashioned into shapes roughly matching his own figure. Our clothing today is testimony of the ingenuity of the past.

But what has gone before is only a small part of what will appear in the future. The fibers and fabrics of tomorrow stagger the imagination and leave the mind speculating in fantasy that has a good chance of some day coming true, regardless of how crazy it may now seem.

A few years ago who would have suspected that useful fibers and fabrics could be made out of cows milk? Or from trees, or coal, or fish, or sand?

These are but a few of the accomplishments of modern chemistry whose test tubes are fashioning fibers and fabrics from unsuspected sources. More and still stranger ones are in store for the future.

Some Very New

Some of these fibers and fabrics have just entered into their commercial life. Their small beginnings are only a foretaste of the future. Others are just about ready to be presented to the consumer. Still others are yet only products of the laboratory but their amazing properties mark them as potent products of days still to come.

Some of the products were obtained by halting, tedious research of previously obscure inventors. Others are outgrowths of intensified research in great industrial laboratories.

Others are the result of the intensified drive of chemistry, throughout the world, for economic self-sufficiency among nations; each country wishing to develop fibers and fabrics synthetically so that it may be liberated from dependence on foreign imports that might fail in time of war.

This international drive for ersatz materials, as the Germans call them, cannot be overlooked in any study of tomorrow's fibers and fabrics. Under the spur of national defense a country feels justified in expending great amounts of money to produce synthetic materials that will replace others that normally would be imported.

Wool, cotton, flax, and silk just about exhaust the natural materials from which clothing can be made. The drive for synthetic substitutes is particularly intensified in those nations which do not possess sufficient amounts of these raw materials within their own boundaries.

Italy, spurred by the need of economic self-containment and freedom from importing products that would be cut off in time of war, is the land of Lanital—the synthetic wool-like fiber made from cow's milk.

Service and Beauty

Yes, highly serviceable and beautiful fibers and fabrics are now being made out of the casein in milk. And because the casein of American milk is no different from that found in the milk of Italian cows, the day is not far away when a similar material will be produced commercially in the United States. Already scientists at the U. S. Department of Agriculture are doing it experimentally and also the research laboratories of American industry.

Man-made wool fibers are not only highly serviceable but are cheap to produce because only slight modifications of existing rayon machines are needed.

Casein, well-known as the essential ingredient of cheese, is the basic ingredient of this new rival for the fleece off a sheep's back. Moreover, in the process, every other part of milk besides the casein is also used. None is wasted.

The raw milk is skimmed for its cream and fat that goes into butter. The skimmed milk is then treated with acid to coagulate the casein into curds. The whey, that separates off at this stage, is treated to neutralize the acid and is then fed to pigs.

From the casein curds comes the dried casein powder that is the starting point of synthetic wool fibers. Twenty-six gallons of cow's milk will produce about 8.8 pounds of butter and 6.6 pounds of casein. A pound of synthetic wool-like fiber can be made out of each pound of casein.

At current American prices the casein in a three-piece dress ensemble costs only about 50 cents for the raw materials.

Actually it is the protein in the casein which is the chemical building block out of which chemistry has fashioned this new and valuable fiber. Because this is so chemists in America, and in other countries, have succeeded in making fibers out of a variety of proteins.

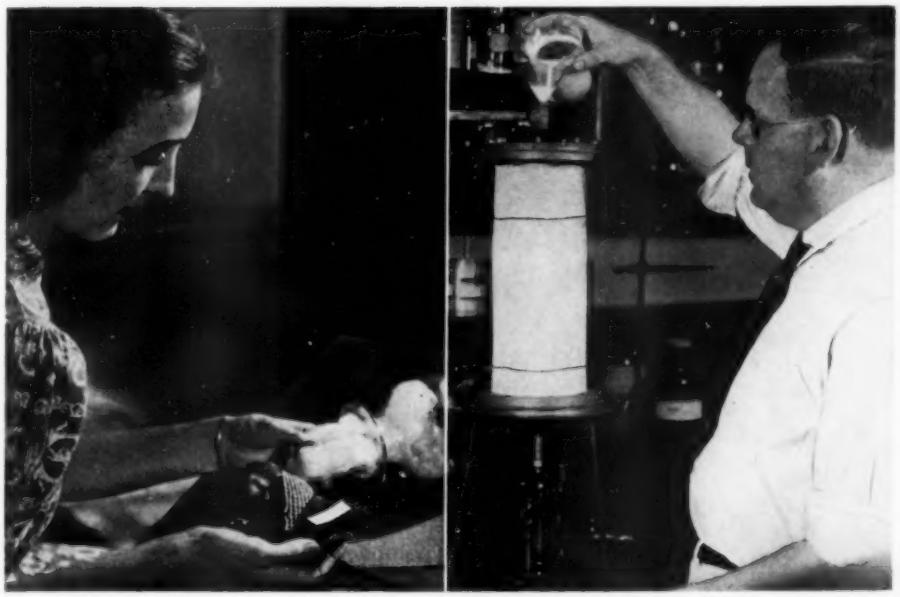
Even From Fish

Thus in America fibers have been made out of soybeans. In Japan and in Germany the protein of fish has been experimentally used as a source for wool-like fibers.

According to chemical analyses of synthetic wool fibers it has been shown that they contain every chemical element found in natural wool in almost identical proportions, except that the sulfur con-

THANKS TO BOSSIE

For the yarn in this attractive sweater our gratitude must go to the cow, not the sheep. It is made from the casein in milk.



RESEARCH IN THE UNITED STATES

America is not neglecting the possibility of making wool from milk. Earl O. Whittier of the U. S. Department of Agriculture is shown here pouring a solution of casein which is to be treated chemically so that it will produce useful fibers. On the left, you see the wool and samples of wool-like fabrics which can be woven from it.

tent in man-made wool is slightly less than in natural wool, and the carbon content a little more.

An analysis of the two "wool" fibers looks like this:

	Synthetic Wool	*Natural Wool*
Carbon	53 per cent	49.25 per cent
Hydrogen	7 per cent	7.57 per cent
Oxygen	23 per cent	23.66 per cent
Nitrogen	15.50 per cent	15.86 per cent
Sulfur	.70 per cent	3.66 per cent

In a process that employs much of the equipment of present-day rayon plants, the casein of milk is dissolved in chemicals and made into a syrupy liquid. When at the proper consistency this liquid is passed through tiny orifices called spinnerettes. As the myriad of fine streams of liquid come out of the spinnerettes they enter a chemical bath of formaldehyde and are hardened into fibers.

In a continuous process these newborn fibers pass on to other tanks containing solutions that will mature them. Finally they are dried and become masses of "wool" looking quite like the cleaned shearings from a sheep's back. This wool is then spun into yarns for weaving and knitting in the usual fashion.

The man-made synthetic wool fibers are solid, can be made in controlled size of diameters and as long as is desired. In their solid nature the fibers compare with the finest merino wool, which likewise is solid. Cheaper grades of wool show a characteristic hollow center space in their fibers.

Ever since wool-from-milk fibers have been produced scientists have been wondering if bacteria—which can so easily attack milk and make it sour—cannot also attack synthetic casein fibers.

Two Dutch scientists have recently tested their problem and found that casein-eating bacteria in the air will, indeed, destroy the synthetic fibers. The bacteria liberate a chemical enzyme which does the job. Heat is found to destroy this enzyme reaction.

But before you humorously picture wearers of synthetic wool clothing boiling their clothes periodically in hot water to prevent their destruction, realize that the criticism is more academic than practical in its importance.

For years the major part of the buttons in the world have been made from casein. These casein buttons, too, can be destroyed by bacteria in special laboratory tests. However, this knowledge has never stopped the use of such buttons. In real life, conditions are so unfavorable for bacterial enzymic action on casein used in clothing that objections on this score are not too important.

Conservative scientists, seeking to weigh the future of synthetic wool-like fibers, are reluctant to picture the complete displacement of natural wool by this new chemical rival.

They see rather the situation as one potentially like the rayon development where rayon has displaced natural silk in some fields but has achieved its greatest usefulness after it stopped trying to be a substitute for silk and became a fiber in its own right with its own valuable uses.

Synthetic fibers, like the amazing artificial wool made from the casein of cow's milk, have not sprung, full-blown out of the minds of chemists; marvelous and ingenious though those minds may be.

All modern synthetic fibers owe their debt to rayon, the granddaddy of them all. And though rayon may be the research parent of the fibers of the future it is no doddering, enfeebled parent which has outlived its usefulness.

The pioneer synthetic fiber and giant of the industry today is widening its circle of achievement and usefulness.

Rayon's rise came swiftly after the World War. In the decade and a half from 1921 to 1935 cotton showed an increased consumption of about 6%. Wool, in the same period, gained 17% and silk increased its production by 47%. But rayon, for the same 15 years, increased

Mr Tompkins in Wonderland

by G. GAMOW

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production 1,000% or ten times the 1921 figures.

This dramatic rise is no freak thing but an economic tribute to a synthetic fiber which has demonstrated that it could stand on its own feet and render its own service, not as a substitute for something else, but as a product which possesses special properties of its own.

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It was not always thus. Rayon's origin, in fact, came about in attempts to duplicate natural silk. For centuries man had watched the silkworm chew up mulberry leaves and extrude a tiny thread for its cocoon that man called silk.

If a worm could take plant cellulose and produce such a fiber, reasoned chemists, why could not scientific research do the same thing.

For years no man succeeded in this dream. And then, in the year 1886, the French nobleman, Hilaire de Chardonnet deposited with the French Academy of Sciences a sealed envelope with instructions that it be opened three years later. In 1889, then, the process for making artificial silk was given to the world.

True, the early synthetic filaments were not as strong as silk, they could not stand moisture like natural silk, they could not be made as fine as silk, nor could they do many other things. But the beginnings of the present rayon industry were laid.

The artificial silk industry of those early years struggled on not quite realizing that among its biggest handicaps was that it sought to duplicate silk. The fibers had a shiny luster somewhat like silk. The appearance, however, was far from genuine and the shininess came only to be the mark of an inferior and substitute product.

●RADIO

Dr. Vergil D. Reed, assistant director of the Bureau of the Census, will describe plans for the 1940 national census as guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, February 22, 4:15 p.m., EST, 3:15 CST, 2:15 MST, 1:15 PST.

Listen in on your local station. Listen in each Thursday.

With the World War came a vast expansion in the plants of the rayon industry; an enlargement far out of accord with any consumption of shiny artificial silk. The reason was that it was only a chemical twist of the wrist to convert the fiber plants into factories for producing high explosives of nitrocellulose and for the production of "dope" for airplane wings.

But when peace returned there was temporary dismay. Vast plants lay idle for a time, with enormous production possible, but with no peacetime markets.

But the ingenuity of chemistry solved this problem by taking out the telltale luster of shiny artificial silk and producing a softer appearance. That—together with an international agreement to define the man-made fiber by a generic name, rayon—did much to lift the rayon industry on its upward course which has surged onward so remarkably in the last decade and a half.

The rayon industry had one thing which the natural silk industry could never quite attain, absolute control of production to bring uniformity of product. And out of research came variations of basic rayon fibers which would dye more beautifully than any natural fibers.

The key for uniformity was that you can control a machine but never a silk-

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worm. And the key to better dyeing was that the chemists could juggle atoms in the chemical molecules and make them accept bonds with the molecules of dyes which nature never equaled.

The ability to take dyes, in fact, opens the economical and clever process of what the trade calls cross dyeing that is possible with combination fabrics of rayon with wool, cotton or natural silk. In cross dyeing the combination material is run through two different dye vats; one containing dye for the natural fiber and another for the rayon fiber.

In terms of economics this means that a combination fiber of rayon and some natural fiber can be woven in undyed form. Then, after the stylists have decided on the colors for this year's hues, the materials can be dyed. Thus mass production can be obtained with undyed fabrics and the dyeing takes care of itself later with the basic, undyed stock.

The debt all synthetic fibers owe the rayon industry consists not only of the encouragement which one research achievement can bring to scientific workers struggling in another field, but also to the development of manufacturing machines which frequently are readily adaptable for making fibers from other sources.

Rayon's bag of tricks—backed by some of the most clever chemical laboratories of the land—is by no means exhausted. Crush-proof, moisture-resistant rayons are here and other advances are on the way. Rayon's future as a fiber, in fact, is by no means limited solely to the textile field for wearing apparel.

Cords of rayon are now going into longer wearing and stronger motor vehicle tires, especially useful for trucks and busses.

On the sea the marine counterparts of these cords for tires appeared in the sails of the American yacht, *Ranger,* which successfully defended the America's Cup against the British challenger, Endeavor II.

No, don't worry too much about rayon. He may be granddaddy to many a research fiber, but as a parent he will be able to take on the "kids" for many a year to come.

Fabrics from glass, metal, coal, air and water and even paper and rubber will be described in a future issue.

Science News Letter, February 17, 1940

All beekeepers get stung occasionally, says one expert; but the secret of avoiding it is to work with bees on bright sunny days when they are busy, to work deliberately, and protect your face with a good veil.

"Silk Stockings in the Morning!"

SILK stockings a luxury? Not today, but they were 25 years ago. So was an automobile, and a telephone. An incandescent lamp—not half so good as the one you now get for 15 cents—then cost more than twice as much. And you couldn't buy a radio or an electric refrigerator for love or money.

These are only a few of the things we accept today as commonplace. We expect smooth, well-lighted streets. We want automatic heat in our homes; we clean our rugs with vacuum cleaners. We accept without comment an X-ray examination as part of a medical check-up. Luxuries? No. They're part of the American standard of living.

How did they become common in so short a time? Through years of steady work by American industry—scientists, engineers, and skilled workmen developing new products, improving them, learning to make them less expensive so that more millions of people could enjoy them. And so, imperceptibly, luxuries have changed to necessities.

More than any other one thing, the increasing use of electricity in industry has helped in this progress. For more than 60 years, General Electric men and women have pioneered in making electricity more useful to the American people—have led in creating More Goods for More People at Less Cost.

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COLD BEAUTY

Beauty of two forms of frozen water is well illustrated in the cover picture and the two accompanying ones. On the cover is shown the result of a rapid fall of snow in still air, intercepted by the seed-balls of a sycamore. The pictures on this page and the facing page show the formation of hoar-frost or rime on the twigs of trees, after a night when chilly mist hung over the lowland where they grew.

PHYSIOLOGY

Find Pituitary Extract Influences Use of Sugar

A NEW attack on diabetes, by way of the pituitary gland, has been launched through researches by Prof. J. B. Collip, of McGill University.

A specially prepared extract of the pituitary, small but important gland in the head, "has a profound effect upon carbohydrate metabolism," Prof. Collip has found.

Carbohydrate metabolism, the utilization by the body of sugars and starches from foods, is the mechanism that goes wrong in diabetes. Failure of the Islands of Langerhans in the pancreas to produce sufficient insulin has been considered the cause of the condition, and insulin in proper dosage keeps diabetics healthy. Other glands besides the pancreas, however, have been shown to play a part in carbohydrate metabolism. In fact, scientists know that the glands of internal secretion, such as pancreas, pituitary, thyroid and adrenals, are closely related and influence each other in various ways.

Now that a pituitary gland extract which affects the body's utilization of sugar and starch has been discovered, the next step will be to learn how it achieves this effect.

The work is still in an early stage and is purely of academic interest as yet, Prof. Collip emphasized. But it has already raised a number of questions which, when solved, may show the whole problem of carbohydrate metabolism and of diabetes in a clearer light.

Among the questions to be answered are whether the pituitary extract achieves its effect on sugar utilization directly, whether it acts through the adrenal glands, whether it acts by stimulating the pancreas to produce more insulin, and whether it reenforces the action of insulin by the process of synergy.

Science News Letter, February 17, 1940

BIOLOGY

Shrimp Embryos Survive Six Months Without Air

CHAMPIONSHIP honors for plain, unvarnished ability to "take it" are claimed on behalf of embryos of the little brine shrimp species known as Artemia, by Prof. Douglas M. Whitaker of Stanford University.

In the encysted state, a special condition in which the young shrimp survive hard seasons, they have been kept sealed in glass tubes under high-vacuum conditions for six months. During all that time they had no oxygen, yet when the glass was cracked and the embryos deposited in strong brine they went on through with their development as if nothing had happened. Other embryos were able to develop normally after a 24-hour immersion in liquid air, at a temperature of 310 degrees below zero.

Further tests are being made against time. Encysted embryos are being kept in bottles, which will be opened at five-year intervals, to see how long the little animals can live in this state of suspended animation.

Artemia is a small species of shrimp, found only in lakes of concentrated brine, saltier than sea water, such as the Dead Sea in Palestine and Great Salt Lake and Mono Lake in this country.

Similar resistance to extreme conditions has been found by Drs. C. V. Taylor and A. G. R. Strickland, also of Stanford University, in a lower animal form known as Colpoda, that lives in ordinary ponds.

Science News Letter, February 17, 1940

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PLANT PATHOLOGY

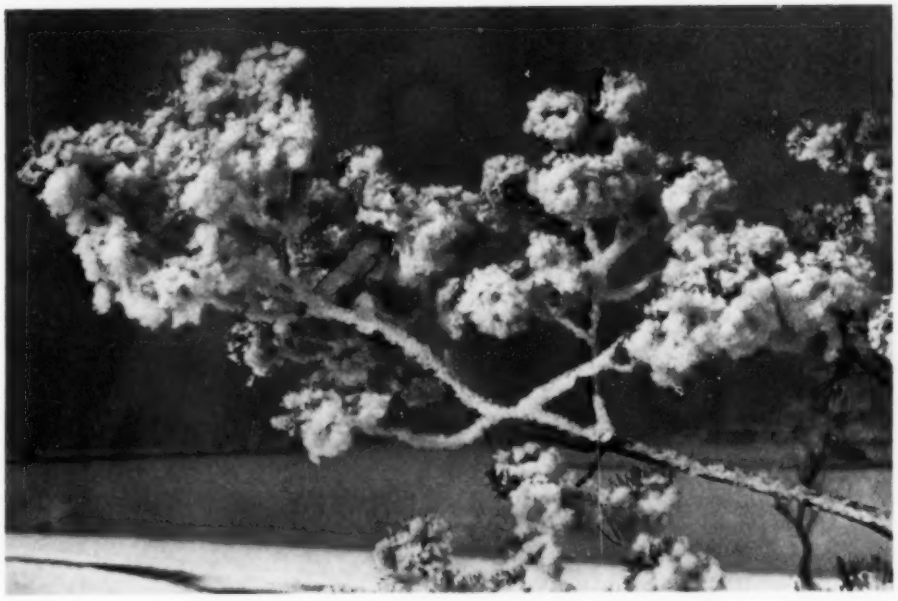
Mimosa Trees Menaced By New Fungus Disease

MIMOSA trees, whose bright flowers and delicate, feathery, gray-green foliage are a delight to winter sojourners in Southern resorts, are menaced by a new disease, apparently caused by a soil-dwelling fungus.

Little is known about the disease, except that it kills the trees very quickly and spreads rapidly. Its center of distribution, reports Dr. George H. Hepting of the U. S. Department of Agriculture, is at Tryon, N. C., and dead trees have been found as far north as Richmond, Va., and as far south as LaGrange, Ga.

Diseases that may be early stages in tree-killing epidemics are also being studied by Department scientists in willows, oaks, shortleaf pines, Monterey cypress and Douglas fir. Two deadly diseases menace the American elm, and the London plane tree, favorite in cities because of its resistance to smoke, is under attack in centers along the Atlantic seaboard. Millions of dollars are being spent to save white pines from blister rust. The persimmon, whose wood is unequalled for golf club heads, will probably soon join the already extinct native chestnut. America's trees are in greater danger than most Americans realize.

Science News Letter, February 17, 1940



CLOSE UP

This is how the trees on the facing page looked at nearer view.

POPULATION

Low Birth Rate Linked With Finland's Economic Progress

FINLAND, today in the limelight as a country which has done well with meager resources, appears to owe its success partly to a declining birth rate and emigration, both of which have kept down crowding of farm population, that plagues central Europe.

A report (*Population Index,* January) shows that the Finnish birth rate has tobogganed an irregular but mainly downward course for two centuries. From 45 births per 1,000 population in mid-eighteenth century, the birth rate stood at 20 per 1,000 in 1937. Thanks to the Swedish parish system of registering vital statistics, Finland has a continuous record of births and deaths from 1750, to show trends.

Characterizing Finland as predominantly rural, though with a strong recent trend toward city and industrial development, the report says that most of Finland's farmers hold small land areas, but three-fifths of the farm families own their land. Only seven per cent of the land is cultivated. The soil is thin, deficient in lime and phosphorus. Marshlands are so acid that it takes generations of cultivation to make them productive.

Factors which have enabled the Finns to achieve a reasonably satisfactory adjustment of population to their resources without extreme wealth or extreme poverty include intelligent use of these meager resources, the cultural level of the people, forward-looking social legislation.

Science News Letter, February 17, 1940

Plant Experiments
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•First Glances at New Books

Economics

HOW TO MAKE YOUR BUDGET BALANCE—E. C. Howard and Helen Fowle—*Amer. Inst. for Economic Research,* 143 p., $1. Very practical and useful advice and information, uncontaminated by any commercial motive. Much of the information is put in the form of charts easily used. Subjects covered: Food, the home, clothing, personal allowance, transportation, insurance and savings, borrowing, etc.

Science News Letter, February 17, 1940

Aeronautics

YOUR CAREER IN AVIATION—Charles S. Mattoon—*Foster & Stewart,* 146 p., $1.50. While probably every boy who wants to enter aviation wishes to be a pilot, only a few can be chosen. And yet there are scores of ground jobs in aviation, for every pilot's berth available. This book, by a personnel director of a leading airplane company, gives a summary of the many positions in the industry, what they pay, what qualifications are needed and how and where one can apply for them.

Science News Letter, February 17, 1940

Engineering

THE EXAMINATION OF PLACER DEPOSITS—Thomas A. Graves—*Richard R. Smith,* 168 p., $3. Book for professional engineers on placer mining.

Science News Letter, February 17, 1940

Electrical Engineering

DRAKE'S CYCLOPEDIA OF RADIO AND ELECTRONICS (9th ed.)—Harold P. Manly and L. O. Gorder—*Drake,* 1059 p., $5. The growth of radio and electronics is indicated by the appearance of this, the ninth edition of this encyclopedia, within eleven years. Besides radio, the fields of television, sound pictures, public address systems, photo cells and ordinary electricity are covered.

Science News Letter, February 17, 1940

Botany

FRANCIS WOLLE'S FILAMENTOUS MYXOPHYCEAE—Francis Drouet—*Field Museum of Natural History,* 64 p., 40c. (Botanical Series, Vol. 20, No. 2). Re-examination and critical description of an exceedingly difficult plant group.

Science News Letter, February 17, 1940

Evolution—Philosophy

DIE ENTSTEHUNG DES LEBENS DURCH STETIGE SCHOEPFUNG—Ignaz Lichtig—*Nordemann Publ. Co., New York,* 371 p., $4.15. The author argues, largely on philosophical grounds, for a continuous creation of living out of non-living substance. He holds that this has always gone on, and that it is going on today. If generally accepted, this theory would certainly have revolutionary effects.

Science News Letter, February 17, 1940

Political Science

INSIDE EUROPE (1940 War Edition)—John Gunther—*Harper,* 606 p., $3.50. When the first edition of this book appeared, in 1935, it scored an immediate success. At least as great a success can be anticipated for the present edition, brought down to date to include the exciting events of the new wars that are scarring the world's face.

Science News Letter, February 17, 1940

Economics

ANNUAL REPORT OF THE TENNESSEE VALLEY AUTHORITY FOR THE FISCAL YEAR ENDED JUNE 30, 1939—*Govt. Print. Off.,* 478 p., 75c.

Science News Letter, February 17, 1940

Journalism—Technology

WRITING THE TECHNICAL REPORT—J. Raleigh Nelson—*McGraw-Hill,* 373 p., $2.50. Help for those inarticulate when confronted with the necessity of producing written words. "The report writer must learn to give the reader what he wants in the form most adaptable to his uses."

Science News Letter, February 17, 1940

Architecture

ALL ABOUT HOUSES—Groff Conklin—*Messner,* 194 p., $2. What it takes to build a house illustrated with photographs of virtually every step in housing construction. Every one of the millions of people who are building, or hope to build a home some day will enjoy the simple narrative and pictures that show some of the hidden mysterious operations which go into a finished home.

Science News Letter, February 17, 1940

Chemistry

A COURSE IN GENERAL CHEMISTRY (3rd. ed.)—William C. Bray and Wendell M. Latimer—*Macmillan,* 206 p., $1.60. Chemistry as taught at the University of California in the introductory course. Every laboratory experiment listed has been tested in class for from two to seven years and the text material generally has been in use, except for revisions to keep abreast of progress, for nearly 20 years.

Science News Letter, February 17, 1940

Agriculture

AMERICAN HUSBANDRY—Harry J. Carman, ed.—*Columbia Univ. Press,* 582 p., $5. One of the two most important source-books on the history of American agriculture in Colonial times, first published in London in 1775, is here carefully edited and reproduced for the use of modern scholars. The author, still unknown but conjectured to be the botanist John Mitchell, quite evidently had close first-hand knowledge of his subject from residence and extensive travels in America; he argues cogently for closer cooperation between the Mother Country and the Colonies, as an alternative to the strife and separation which began before the ink on his sheets was fairly dry.

Science News Letter, February 17, 1940

Zoology

ANIMALS ARE LIKE THAT! — Frank Buck—*McBride,* 240 p., $2.50. Vivid and full of action, as Frank Buck's books always are. The photographic illustrations convey a sense of the intensity of tropical sunlight.

Science News Letter, February 17, 1940

General Science

ANNUAL REPORT OF THE SECRETARY OF THE INTERIOR, For the Fiscal Year Ending June 30, 1939—*Govt. Print. Off.,* 458 p., 75c.

Science News Letter, February 17, 1940

Television

THE VICTORY OF TELEVISION—Philip Kerby—*Harper,* 120 p., $1. A layman's story of television; its history, early troubles, laboratory victories and its possibilities.

Science News Letter, February 17, 1940

Electrical Engineering

FORTY-EIGHT MILLION HORSES—Humphrey B. Neill—*Lippincott,* 241 p., $2.50. The story of electrical energy, man's modern silent slave, and how it works for all of us to the tune of nearly 50,000,000 horsepower a year.

Science News Letter, February 17, 1940

Photography

WHAT YOU WANT TO KNOW ABOUT DEVELOPERS — Edmund W. Lowe — *Camera Craft,* 175 p., $2.50. A technical book for the advanced photographer who does his own developing. The author discusses many sorts of fine-grain and non-fine-grain developers for film and paper.

Science News Letter, February 17, 1940